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Bethany Fitzpatrick 4-13-04
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APPEAL BRIEF

This is Appellants' Brief for an appeal from the Final Office Action dated 01/22/2004.

I. REAL PARTY IN INTEREST

The real party in interest is International Business Machines Corporation.

II. RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

III. STATUS OF CLAIMS

Claims 54, 56-62 and 64-69 are pending.

Claims 1-53, 55, 63, and 70-87 have been cancelled.

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IV. STATUS OF AMENDMENTS

A first Final Action was mailed on July 7, 2003. Appellants responded with Remarks, but no changes to the claims. A nonFinal Action was mailed on October 2, 2003. Appellants responded with an amendment to the claims on November 5, 2003, and this was entered. Another Final Action was mailed on January 22, 2003. Appellants submited an amendment dated March 5, 2004 after the Final Action dated January 22, 2004, to cancel claims 70-87 and correct a formal matter in Claim 69. This Amendment was entered. In summary, all amendments submitted by Appellants have been entered.

V. SUMMARY OF THE INVENTION

The invention resides in a method for communicating to a host system a numerically variable characteristic of a subsystem. The subsystem receives a request from the host system to monitor the numerically variable characteristic of the subsystem and report to the host system a value of the characteristic or an amount of change of the characteristic when a minimum numerical amount of the change occurs. The request specifies the minimum numerical amount of the change. In response to the receiving step, the subsystem monitors the characteristic. If and approximately when the minimum numerical amount of the change subsequently occurs in the characteristic, the subsystem reports a value of the characteristic or an amount of change of the characteristic to the host system. If no change occurs or less than the minimum numerical amount of change occurs before a predetermined time-out, the subsystem reports to the host system a value of the characteristic or an amount of change of the characteristic upon the predetermined time-out.

The invention also resides in a computer system comprising a host system and a subsystem coupled to the host system. First programming in the host system generates and sends a request to the subsystem to monitor a numerically variable characteristic of the subsystem and report to the host system a value of the characteristic or an amount of change of the characteristic when a minimum numerical amount of change in the characteristic occurs. The

request specifies the numerical minimum amount of the change. Second programming in the subsystem responds to the request by monitoring the characteristic of the subsystem. If and approximately when the minimum numerical amount of the change subsequently occurs, the second programming reports to the host system a value of the characteristic or an amount of change of the characteristic. If no change occurs or less than the minimum numerical amount of change occurs before a predetermined time-out, the subsystem reports to the host system a value of the characteristic or an amount of change of the characteristic upon the predetermined time-out.

According to another feature of the present invention, the host system also polls the subsystem to report the numerically variable characteristic so there are three different circumstances for reporting.

VI. ISSUES

Claims 54, 56-62 and 64-69 were rejected under 35 USC 103 based on US Patent 5,337,413 to Lui et al. in view of US Patent 6,311,274 to Day and further in view of US Patent 6,470,385 to Nakashima et al. Therefore, the issue is whether claims 54, 56-62 and 64-69 were obvious in view of Lui et al., Day and Nakashima.

VII. GROUPING OF CLAIMS

Group I: claims 54, 56-60

Group II: claim 62, 64-68

Group III: claims 61 and 69

The claims do not all stand or fall together. Rather, each group of claims has independent grounds of patentability relative to the other groups.

<u>VIII. ARGUMENT</u>

Group I

Claim 54 was rejected under 35 USC 103 based on Lui et al. in view of Day and further in view of Nakashima et al. Appellants respectfully traverse this rejection based on the following:

Claim 54 recites a method for communicating to a host system a numerically variable characteristic of a subsystem. The subsystem receives a request from the host system to monitor the numerically variable characteristic of the subsystem and report to the host system a value of the characteristic or an amount of change of the characteristic when a minimum numerical amount of the change occurs. The request specifies the minimum numerical amount of the change. In response to the receiving step, the subsystem monitors the characteristic. If and approximately when the minimum numerical amount of the change subsequently occurs in the characteristic, the subsystem reports a value of the characteristic or an amount of change of the characteristic to the host system. If no change occurs or less than the minimum numerical amount of change occurs before a predetermined time-out, the subsystem reports to the host system a value of the characteristic or an amount of change of the characteristic upon the predetermined time-out.

As noted above in claim 54, the Group I invention pertains to the (a) timing of when the report is sent to the host system, i.e. **if and approximately when the characteristic changes at least a specified amount or in the absence of this amount of change, at the end of a predetermined period,** (b) the **nature of the thing which is reported, i.e. a numerically variable characteristic** and (c) that **the host computer specifies what numerical amount of change is sufficiently noteworthy to warrant a report**. This combination of elements distinguishes amended claim 54 from the prior art, as explained below.

Lui et al. disclose in their Background:

“This invention relates to computer systems, and more particularly to an apparatus and method for monitoring the environment of remote components attached to a central processor by means of interface bus.” Column 1 lines 8-11

“Although such storage devices are located remotely from the host processor, it is still desirable to monitor the operating environment of the storage devices, particularly in fault-tolerant computing appliations. For example, it is important to known the ambient temperature of a storage device enclosure and the operational status of supporting components, such as the power supply and cooling fans.” Column 1 lines 30-37

“Therefore, an environmental monitoring system is needed in the enclosures of the remote-standard bus storage devices to monitor the local environment, and to communicate status information about the environment back to a host processor.” Column 1 lines 53-57.

Lui et al. disclose in their Detailed Description:

“In general, the environment monitoring unit 10 will have a set of Read and Write registers to store the status of a variety of environmental characteristics and **pre-set comparison values from the host processor 1**.” Column 4 lines 22-26.

“During normal operation of the system, the host processor 1 communicates in the Bypass Mode to the storage devices 13 through the host interface transceiver 6 and the drive interface transceiver 7.” Column 4 lines 53-56

“The control unit 9 monitors messages from the host processor 1 transmitted on the interface bus 2, as well as status signals from the environment monitoring unit 10, for exception conditions. Examples of exception conditions are:

1. A Reset Signal from the host processor 1 (optionally followed by a “Monitor Mode” command);

2. “Power up” of the entire system;

3. Abnormal environment conditions detected by the environment monitoring unit 10 **(such as the ambient temperature being out of range).**

. . .

When either exception condition 1 or 2 occurs, the control unit 9 causes the host adapter 3 to switch from Bypass Mode to Monitor Mode. ... Thus, in the Monitor Mode, the only bus communication is between the host processor 1 and the bus interface unit 8, over the connecting interface bus 2.” Column 4 line 66 to Column 5 line 41.

“In the Monitor Mode, environment information may be communicated between the host processor 1 and the environment monitoring unit 10 through the bus interface 8. Such information may include, for example, **environment limits specified by the host processor 1** and stored in registers within the environment monitoring unit 10. **(For example, a control program running on the host processor 1 may specify that the ambient temperature within a particular storage device enclosure should not exceed a desired value;** this value may vary from enclosure to enclosure). Environment status information detected by the environment monitoring unit 10 may be communicated back to the host processor 1. All communication is by means of the standard protocol associated with the interface bus 2.” Column 5 lines 27-41.

“In the first method for initiating a switch from Bypass Mode to Monitor Mode, the host processor 1 recurringly polls the host adapter 3, to permit communication from the environment monitoring unit 10 of abnormal environment conditions. Under this method, the host porcessor issues a Reset Signal on the interface bus 2, followed by a “Monitor Mode” command. The reset Signal and “Monitor Mode” command are deterced by the control unit 9, which causes the host adapter 3 to switch from the Bypass Mode to the Monitor Mode for each polling operation.” Column 6 lines 32-43.

"A third method for switching the host adapter 3 from Bypass Mode to Monitor Mode is to have the control unit 9 assert a "Check Condition" status signal on a reserved signal line of the interface bus 2 coupled to the host processor 1. Such a signal is asserted whenever the control unit 9 detects an abnormal environment condition, as determined by the environment monitoring unit 10. When the host processor 1 receives such a signal, the host processor 1 switches the host adapter from Bypass Mode to Monitor Mode by asserting a Reset signal." Column 7 line 6-16.

Thus, Lui et al. disclose three conditions for sending environmental information from the environment monitor 10 to the host 1:

1. the host processor recurrently polls the host adapter for abnormal environment conditions.
2. the host processor powers up.
3. **the ambient temperature being out of range** causing the control unit to assert a Check Condition to the host.

While Lui et al. disclose that the host may specify an acceptable temperature range, Lui et al. do not disclose or suggest that the host specifies an amount of **change** of temperature or other numerically variable condition to cause the report to be made from the subsystem to the host. Thus, Lui et al. fail to teach the following elements of claim 54, relating to the subsystem reporting when the numerically variable characteristic changes an amount specified by the host system:

"**said subsystem receiving a request from said host system to** monitor said numerically variable characteristic of said subsystem and **report to said host system a value of said characteristic or an amount of change of said characteristic when a minimum numerical amount of said change occurs, said request specifying said minimum numerical amount of said change**;

and

in response to the receiving step, said subsystem monitoring said characteristic, and

> **if and approximately when said minimum numerical amount of said change subsequently occurs in said said characteristic, said subsystem reporting a value of said characteristic or an amount of change of said characteristic to said host system**".

It would not have been obvious in view of Lui et al. to report when the temperature changes a predetermined amount because Lui et al. are only concerned with absolute temperature.

Day disclose:

> "**the alert condition is met when the exceeds_threshold value is greater than 10**. The alert action is to send an e-mail message with the value of TMP to a given address. ... the alert data structure is signed by the originator using a private asymetric cryptographic key belonging to the originator." Column 3 Column 17-35.

> "The ALERT value identifies the alert data structure to which the alert payload corresponds. The ORIGIN value identifies the alert originator. **The TEMP value identifies the temperature determined from the sensor, and EXCEED identifies the number of degrees by which the TEMP value exceeds a threshold temperature.** In one embodiment of the present invention, the alert payload comprises data to be used dynamically by the alert handler in performing an alert action." Column 4 lines 47-55.

Thus, Day also discloses reporting when the temperature exceeds a threshold temperature by a predetermined amount, not when the temperature (whatever it is) **changes** a predetermined amount. Therefore, Day has the same deficiency as Lui et al. relative to claim 54. It would not have been obvious in view of Day and Lui et al. to report when the temperature changes a

predetermined amount because both Day and Lui et al. are only concerned with absolute temperature.

Nakashima et al. disclose asynchronous reporting (from a monitored controller 10 to a monitoring controller 30) of **status** information messages, i.e. traps relating to occurrences of faults or configuration changes:

> "This status message T, serving as a "trap" defined in the SNMP specification, delivers event information such as **faults or configuration changes** occurred in the monitored controllers." Nakashima et al. Column 4 lines 44-46.

Thus, Nakashima et al. do not disclose or suggest reporting of a change in a numerically variable characteristic. (Also, Nakashima et al. do not disclose that the numerical minimum is specified by the host computer.) Therefore, two features of claim 54 are not taught by Nakashima et al. Neither of these features would have been obvious in view of Nakashima et al. because Nakashima et al. are concerned with the occurrence of **events** such as the occurrence of faults or configuration changes, and not numerically variable characteristics. Nakashima's types of events are not quantified; they either occur or do not occur. So, there are no numerical minimums to specify, no need for the host computer to specify them, and no suggestion in Nakashima et al. to consider numerical minimums. Moreover, because Nakashima et al. report qualitatively different matters than in the present invention, Nakasahima et al. add nothing to Lui et al and Day toward the present invention. Therefore, amended claim 54 was not obvious in view of Nakashima et al.

In summary, none of the three cited references teaches that the **amount of change** of a numerically variable characteristic causes a report, and that the host specifies the amount of change to warrant the report. Therefore, the combination of these three references does not teach or suggest the present invention as recited in claim 54. Consequently, the rejection by the Examiner of the claims of Group I should be reversed.

Group II

Claim 62 is similar to claim 54 except claim 62 is a "system" claim whereas claim 54 is a method claim. Therefore, claim 62 distinguishes over the prior art for the same reasons as claim 54 distinguishes thereover. In addition, claim 62 recites that **the subsystem is responsive to a time-out** to report to the host system a value of the characteristic or an amount of change of the characteristic upon the predetermined time-out. In contrast, Lui et al. teach polling **by the host**, where **the host is responsive to a time-out** to send each polling request. To make the subsystem manage the time-out instead of the host would not have been obvious in view of the polling of Lui et al. for the following reasons:

Lui et al. want to combine all the polling requests to form a broadcast:

> "A Reset Signal from the host processor 1 with no "Monitor Mode' command following within the prescribed time period indicates a true Reset Signal. Consequently, the host adapter 3 asserts a Reset Signal on the reset signal lines coupled directly to the storage devices 13 after the expiration of the pre-determined time period. In this implementation, environment status communication between the monitor logic 5 and the host processor 1 occurs on a time-sharing basis with the normal operation of the bus linking the host processor 1 and the storage devices 13. As such, each host processor-to-monitor logic communications must complete in a specified time that is less than the command time-out limit of the storage devices 13." Lui et al. Column 6 lines 9-23.

Day does not disclose use of a time-out to trigger a report; rather the reports are triggered asynchronously upon occurrence of the alert condition.

Nakashima et al. disclose polling by a monitoring station 40 to a monitoring controller 30 for asynchronous data collected by the monitoring controller 30 from amonitored controller 10:

"(S40) The monitoring station 40a transmits a status message collection request R to the monitoring controller 30a. With this request R, the monitoring station 40a specifies what data items should be collected. FIG 9. illustrates specific data items 100 in table form. ... (S41) Upon receipt of the status message collection request R, the polling controller 33 searches the status message storage unit 32 to find records relevant to the data items 100 in question." Column 8 lines 51-63.

Thus, Nakashima et al. disclose an intermediary monitoring controller 30. Nakashima et al. do not teach that the same subsystem that monitors the numerically variable characteristic, reports the change in the numerically variable characteristic upon a time-out within the subsystem. This would not have been obvious in view of Nakashima et al. because Nakashima et al. have a much different configuration, i.e. an intermediary monitoring controller 30 which collects the traps from the monitored controllers 10 and then reports the trap data to the monitoring station 40 upon request from the monitoring station.

Group III

Claim 61 further distinguishes over the prior art of record by reciting that the subsystem comprises a SAF-TE enclosure and programming to support periodic SAF-TE polls made by the host system for the characteristic. In addition, the subsystem receives periodic SAF-TE polls made by the host system, and responds to the periodic SAF-TE polls by promptly reporting the characteristic for each of the polls, whether or not the characteristic has changed.

While periodic polls by a host system alone are not new, the combination of these host polls with the two levels of reporting by the subsystem are new. This three tiered arrangement permits the subsystem to report on its own (in two manners) the amount of change of a characteristic, and to report in response to a host poll, the value of the characteristic.

Based on the foregoing, Appellants request that the Examiners rejection be over ruled.

Respectfully submitted,

Arthur J. Samodovitz

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IX. APPENDIX - PENDING CLAIMS:

54. A method for communicating to a host system a numerically variable characteristic of a subsystem, said method comprising the steps of:

said subsystem receiving a request from said host system to monitor said numerically variable characteristic of said subsystem and report to said host system a value of said characteristic or an amount of change of said characteristic when a minimum numerical amount of said change occurs, said request specifying said minimum numerical amount of said change; and

in response to the receiving step, said subsystem monitoring said characteristic, and

if and approximately when said minimum numerical amount of said change subsequently occurs in said said characteristic, said subsystem reporting a value of said characteristic or an amount of change of said characteristic to said host system,

if no change occurs or less than said minimum numerical amount of change occurs before a predetermined time-out, said subsystem reporting to said host system a value of said characteristic or an amount of change of said characteristic upon said predetermined time-out.

56. A method as set forth in claim 54 wherein said characteristic of said subsystem is a characteristic of a component coupled to said subsystem.

57. A method as set forth in claim 54 wherein said characteristic is a temperature of said subsystem.

58. A method as set forth in claim 54 further comprising the steps of:

before the receiving step, establishing a communication link between said host system and said subsystem;

after the receiving step but before the reporting step, terminating said communication link; and

after the terminating step but before said reporting step, establishing a communication link between said host system and said subsystem for said reporting.

59. A method as set forth in claim 58 wherein each of said communication links comprises SCSI commands and protocol.

60. A method as set forth in claim 54 wherein said subsystem comprises a SAF-TE enclosure, and said characteristic of said subsystem pertains to said SAF-TE enclosure.

61. A method as set forth in claim 54 wherein said subsystem comprises a SAF-TE enclosure and programming to support periodic SAF-TE polls made by said host system for said characteristic, and further comprising the step of said subsystem receiving periodic SAF-TE polls made by said host system, and said subsystem responding to said periodic SAF-TE polls by promptly reporting said characteristic for each of said polls, whether or not said characteristic has changed.

62. A computer system comprising a host system and a subsystem coupled to said host system, said computer system comprising:

first programming in said host system to generate and send a request to said subsystem to monitor a numerically variable characteristics of said subsystem and report to said host system a value of said characteristic or an amount of change of said characteristic when a minimum numerical amount of change in said characteristic occurs, said request specifying said numerical minimum amount of said change;

second programming in said subsystem to respond to said request by monitoring said characteristic of said subsystem, and

if and approximately when said minimum numerical amount of said change subsequently occurs, reporting to said host system a value of said characteristic or an amount of change of said characteristic,

if no change occurs or less than said minimum numerical amount of change occurs before a predetermined time-out, said subsystem reporting to said host system a value of said characteristic or an amount of change of said characteristic upon said predetermined time-out.

64. A system as set forth in claim 62 wherein said characteristic of said subsystem includes a characteristic of a component coupled to said subsystem.

65. A system as set forth in claim 62 wherein said characteristic is a temperature of said subsystem.

66. A system as set forth in claim 62 further comprising:

means for establishing a communication link between said host system and said subsystem before said first programming sends said request to said subsystem;

means for terminating said communication link after said first programming sends said request but before said subsystem responds to said request; and

means for establishing a communication link between said host system and said subsystem after said terminating of said communication link but before said subsystem responds to said request, to enable said subsystem to report said status.

67. A system as set forth in claim 66 wherein each of said communication links comprises SCSI commands and protocol.

68. A system as set forth in claim 62 wherein said subsystem comprises a SAF-TE enclosure, and said characteristic of said subsystem pertains to said SAF-TE enclosure.

69. A system as set forth in claim 62 wherein said subsystem comprises a SAF-TE enclosure; and further comprising third programming within said subsystem to respond to periodic SAF-TE polls by promptly reporting said characteristic of said subsystem for each of said polls, whether or not said characteristic has changed.